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## ElemenTS: Elementary Teachers of Science – Building Collaborations between Content and Pedagogy Communities

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# **Abstract for DBER Group Discussion on 2013-11-21**

## **Presenter(s), Department(s):**

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University of Nebraska-Lincoln

Jenny Melander

Assistant Professor

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## **Title:**

ElementTS: Elementary Teachers of Science – Building Collaborations between Content and Pedagogy Communities

## **Abstract:**

The current UNL elementary teaching program does not include a science methods practicum in which pre-service elementary teachers could observe and teach reformed based science lessons in the classroom setting. The science methods course was modified during Spring 2013 to address this missing component. The exploratory course engages pre-service teachers in designing and implementing a science unit (a series of lessons) to be taught as a science club in an after school program for K – 5th grade students. In Fall 2013, the course experiences expanded to include collaborating with biomedical engineering students in connecting real-world applications to teaching science. The objectives for the collaboration include:

- 1) Teaching science that connects real-world applications to develop science literacy;
- 2) Elementary teachers: develop knowledge of teaching and learning science concepts; and
- 3) Biomedical Engineering Students: develop communication skills with the community.

This presentation is on the development of a program that emphasizes collaboration between content and pedagogy specialists and the initial ideas that each group holds towards teaching and learning science.

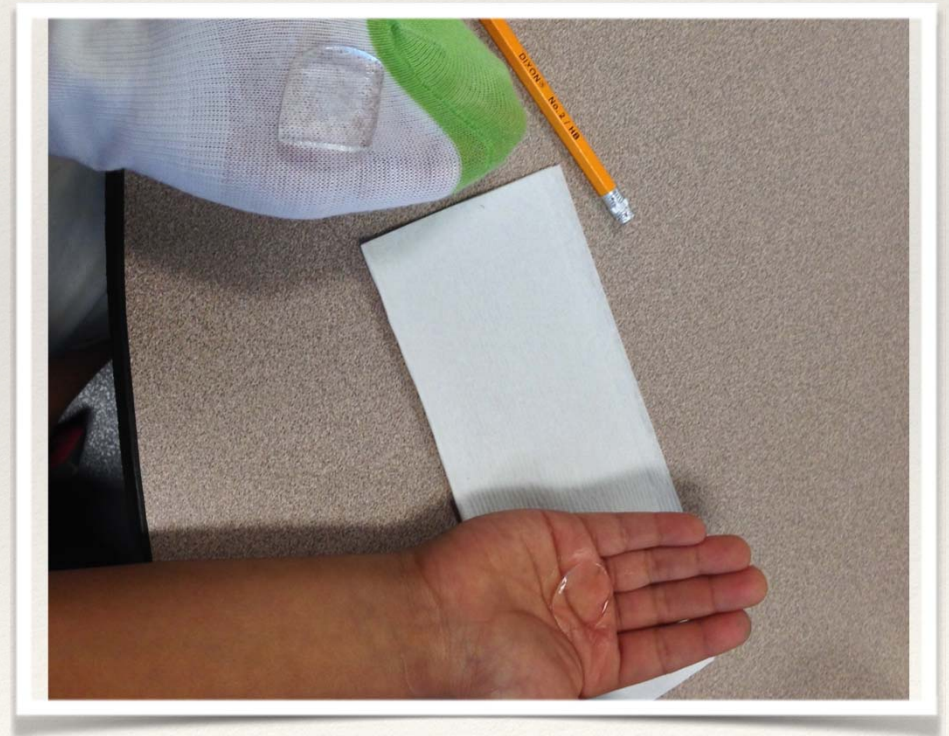
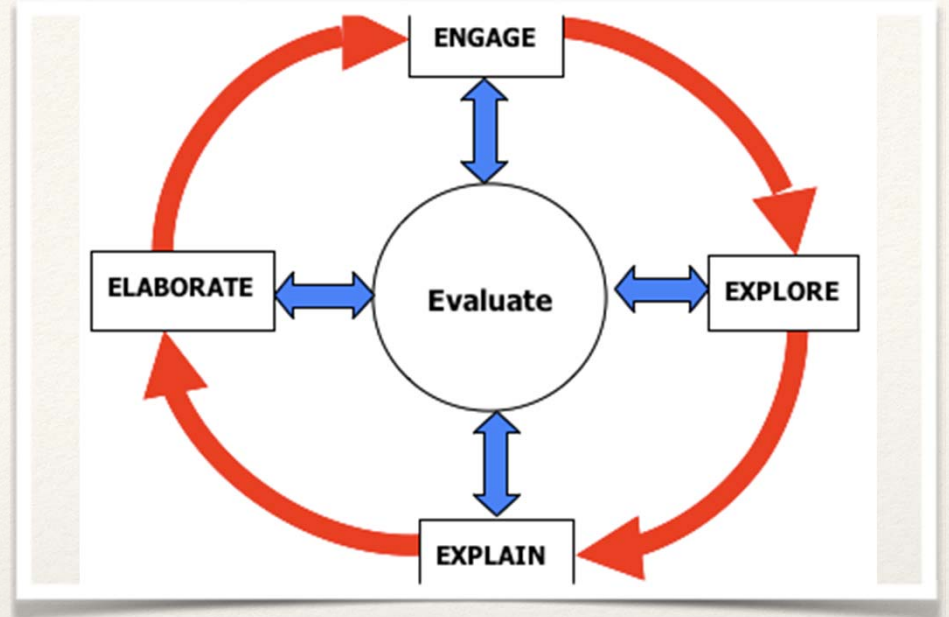


*DBER Group Discussions*

# Building Collaborations between Content and Pedagogy Communities

Krista L. Adams, TLTE  
Jenny Melander, BSE







# The Pedagogy Community

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- ❖ Often are more comfortable with inquiry rather than their own content knowledge (Howes, 2002)
- ❖ Should understand the ideas that scientists use to describe and explain phenomenon (Schibeci & Hickey, 2000).
- ❖ Need to be supported in constructing student learning of science in meaningful ways that emphasize subject matter (Zemba-Saul et al., 2002)
- ❖ Need to seek out ways to enhance their own science knowledge (Fitzgerald et al., 2012).



# The Science Community

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- ❖ Communicating science to the public is important
- ❖ Need to understand issues with communicating between different types of people/backgrounds
- ❖ Need to develop skills for overcoming communication barriers
- ❖ Recognize skills in people with different backgrounds



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# ABET controversial focus on “professional” skills

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- ❖ An ability to function on multi-disciplinary teams
- ❖ An understanding of professional and ethical responsibility
- ❖ An ability to communicate effectively
- ❖ The broad education necessary to understand the impact of engineering solutions on a global, economic, environmental and societal context
- ❖ A recognition of the need for, and an ability to engage in lifelong learning
- ❖ A knowledge of contemporary issues



# Science Club Group

- Determine the Essential Question/Big Idea/Main Idea
- What do you expect students to understand about this concept and be able to do as a result?
- Design a series of lessons that focus on a science concept
  - The Science of Pizza (acids, proteins and conduction of heat)
  - Penguin Buddies
  - Ladybugs
  - Chemical Transformers (physical and chemical changes)
  - Shocking Secrets (electricity)
  - Bubble Buddies (bubbles and cells)
- Students that cannot work in the CLC develop a video that correlates to topic.







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#### Expert Contributions:

Reagan, Lincoln Zoo Penguin Specialist

Dr. G. Jones, Associate Professor of Nutrition and Health Science

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#### Videos:

[Penguins!](#)

What is the science behind Pizza?

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# BSEN Culminating Project

- Provide science/engineering knowledge for TLTE students throughout outreach activity
- Design and implement culminating project related to biological engineering





#teac315 #bsen what did u think scientists would look like? Would have white coats and shoes. 2nd grader.

← Reply 🗑 Delete ★ Favorite ... More

1

FAVORITE



2:10 PM - 15 Nov 13



**Krista Adams**

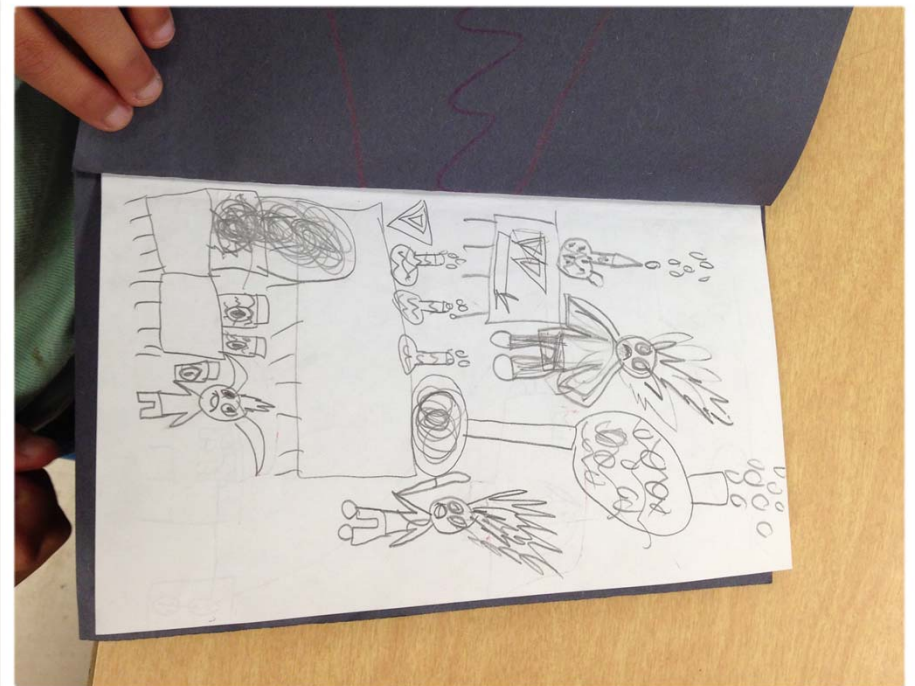
@Dr\_Darth

#bubblebuddies #teac315 #bsen "I want to know about bubbles and our bodies right now" male 2nd grader.

← Reply 🗑 Delete ★ Favorite ... More

2:21 PM - 15 Nov 13 📍 from Lincoln, NE

Reply to @Dr\_Darth









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# Research Question

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- ❖ What are the affordances and barriers in communication between pre-service teachers and undergraduate biomedical engineering students?





# Students Responses to Working Together

- ❖ Advantages:
  - ❖ TLTE:
    - ❖ Subject matter knowledge.
    - ❖ Different point of view. Creative.
  - ❖ BSEN:
    - ❖ Different point of view. Creative.
    - ❖ Have teaching experience.
- ❖ Hard to communicate!
  - ❖ Different set of skill sets and vocabulary.
  - ❖ Subject matter knowledge.
- ❖ Difficulty finding time to work together.
- ❖ Finding ways to connect the BSEN's ideas to our lesson plans.





# Where do we go now?

- ❖ Focus groups: Initial findings.
- ❖ How can we help both groups gain the knowledge to communicate science to the public?
- ❖ Continued Outreach Collaborations





# Any volunteers to collaborate?

- ❖ Provide outreach to your students.
  - ❖ Spring 2013, Emily Hammerl\* in Forensic Science
  - ❖ Fall 2013, Jenny Melander
- ❖ Participate in an educational video developed by students.
- ❖ Experiences for pre-service teachers.
  - ❖ Bumble Bee Buddies w/Doug Golick (Entomology). Simulate school gardens & citizen scientists.
  - ❖ Video workshop w/Barney McCoy (College of Journalism and Mass Communications). Work with students that are putting together videos.





# Thank You!

- ❖ BSEN & TLTE students!!!
- ❖ Community Learning Centers @
  - ❖ Brownell Elementary
  - ❖ Northwood Park Elementary
  - ❖ Riley Elementary
  - ❖ Huntington Elementary
- ❖ Dan Hartig, CEHS Media Specialist
- ❖ [elementscompounds.wordpress.com](http://elementscompounds.wordpress.com)
- ❖ Krista Adams: [kadams12@unl.edu](mailto:kadams12@unl.edu)
- ❖ Jennifer Melander: [jmelander7@unl.edu](mailto:jmelander7@unl.edu)

